



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/027,046	12/20/2001	Alexander M. Shukh	S01:12-0851/STL9652	2220

7590 08/26/2004

PAUL T. DIETZ
WESTMAN CHAMPLIN & KELLY
Suite 1600 - International Center
900 South Second Avenue
Minneapolis, MN 55402-3319

EXAMINER

DAVIS, DAVID DONALD

ART UNIT PAPER NUMBER

2652

DATE MAILED: 08/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/027,046

Applicant(s)

SHUKH ET AL.

Examiner

David D. Davis

Art Unit

2652

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on July 23, 2004 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Art Unit: 2652

Claims 1-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicants Admitted Prior Art (AAPA) as shown in figure 2 and described on pages 5-10 in view of Lairson et al (US 5,822,153). Figure 2 of AAPA shows perpendicular writing element 134 including main pole 144, having a main pole tip, and return pole 140, having a return pole tip, located downstream of pole 144 relative to the rotating disc 102. Pole 144 is connected to pole 140 at the back gap. Write gap 146 is between poles 144 and 140. Conductive coil 150 is between poles 144 and 140 to induce magnetic flux. Perpendicular reading element 136 is downstream. Reading element 136 includes top shield 138 and read sensor 138 positioned between shield 142 and return pole 140, which serves as a bottom shield for sensor 142.

AAPA also shows in figure 2 an area of disc-facing surface of the main pole tip that is less than an area of a disc-facing surface of the return pole tip.

AAPA is silent as to the magnetic flux traveling from pole 144 instead of into pole 144. AAPA also is silent, however as to a separate pole and shield. AAPA is additionally silent as to the poles material being selected from a group consisting of CoZr, CoZrNb, Ni₄₅Fe₅₅, FeN, FeAlN, CoFe, CoNiFe, NiFe and Fe. AAPA is further silent as to a thickness of the non-magnetic layer being approximately 1 micrometer or greater and the gap layer being 1 micrometer or less. The applied prior art is additionally silent as to the non-magnetic layer being formed of a conductive layer sandwiched between insulating layers with the conductive layer being copper, aluminum, tantalum, or tungsten.

Lairson et al shows in figure 3 head 69 including perpendicular writing element 75 including a main pole 84 having a main pole tip and a return pole 88 having a return pole tip located downstream of pole 84 relative to rotating disc 41. Return pole 88 is connected to main

Art Unit: 2652

pole 84 at a back gap. Write gap 86 is between poles 84 and 88. Conductive coil 93 is between poles 84 and 88 and adapted to induce magnetic flux.

Lairson et al shows in figure 2 a perpendicular read element upstream element 75 that includes top shield 77 and bottom shield 80 upstream of shield 77. Read sensor 70 is positioned between shields 77 and 80. A non-magnetic layer, which is formed of a non-magnetic insulative material, alumina (i.e. aluminous oxide), separates top shield 77 from main pole 84.

Official notice is taken of the fact that poles formed from material being selected from a group consisting of CoZr, CoZrNb, Ni₄₅Fe₅₅, FeN, FeAlN, CoFe, CoNiFe, NiFe and Fe; a thickness of the non-magnetic layer being approximately 1 micrometer or greater and the gap layer being 1 micrometer or less; and a non-magnetic layer being formed of a conductive layer sandwiched between insulating layers with the conductive layer being copper, aluminum, tantalum, or tungsten is notoriously old and well known in the magnetic head art.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to reverse the magnetic flux traveling *from* the main pole instead of *into* main pole making it the return pole. The rationale is as follows: the purpose of the poles is to provide a path in the magnetic circuit for the magnetic flux. The magnetic flux need not be limited to one direction to complete the magnetic circuit. Realizing this, one of ordinary skill in the art at the time the invention was made would have been motivated to reverse the magnetic flux, which is well within the purview of a skilled artisan and absent an unobvious result, so that it traveled into the main pole making it the return pole because the two directions are considered to be art recognized equivalents.

Art Unit: 2652

It also would have been obvious to a person having ordinary skill in the art at the time the invention was made to provide the head of AAPA with a separate shield and pole as taught by Lairson. The rationale is as follows: the purpose of the pole and shield is to contain and direct flux. The shield and pole need not be merged to contain and direct flux. Realizing this, one of ordinary skill in the art at the time the invention was made would have been motivated to substitute a separate shield and pole, which is well within the purview of a skilled artisan and absent an unobvious result, with a merged shield and pole because the two arrangements are art recognized equivalents.

It additionally would have been obvious to a person having ordinary skill in the art at the time the invention was made to specify that the pole of the applied prior art is selected from a group consisting of CoZr, CoZrNb, Ni₄₅Fe₅₅, FeN, FeAlN, CoFe, CoNiFe, NiFe and Fe and specify that a non-magnetic layer of the applied prior art is formed of a conductive layer sandwiched between insulating layers with the conductive layer being copper, aluminum, tantalum, or tungsten as taught in the art. The rationale is as follows: one of ordinary skill in the art at the time the invention was made would have been motivated to specify that a pole is selected from a group consisting of CoZr, CoZrNb, Ni₄₅Fe₅₅, FeN, FeAlN, CoFe, CoNiFe, NiFe and Fe and specify that a non-magnetic layer is formed of a conductive layer sandwiched between insulating layers with the conductive layer being copper, aluminum, tantalum, or tungsten, which is well within the purview of a skilled artisan and absent an unobvious result, because of the known magnetic properties for the poles and the known conductive properties of the conductive layer.

Art Unit: 2652

It further would have been obvious to a person having ordinary skill in the art at the time the invention was made to specify the thickness of the non-magnetic layer and the thickness of the gap layer of the applied prior art to be 1 micrometer or greater and 1 micrometer or less, respectively, as taught in the art. The rationale is as follows: one of ordinary skill in the art at the time the invention was made would have been motivated to specify the thickness of the non-magnetic layer and the thickness of the gap layer of the applied prior art to be 1 micrometer or greater and 1 micrometer or less, respectively, which is well within the purview of a skilled artisan and absent an unobvious result, so as to optimize the writing of information to the magnetic disc.

Response to Arguments

4. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

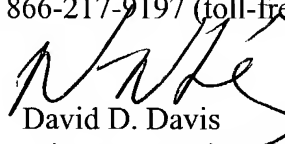
Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David D. Davis whose telephone number is (703) 308-1503. The examiner can normally be reached on Monday thru Friday between 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa T. Nguyen can be reached on (703) 305-9687. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2652

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



David D. Davis
Primary Examiner
Art Unit 2652

ddd